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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,370	10/12/2000	Masashi Saito	07553.0010	4800

22852 7590 02/21/2003

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EXAMINER	
KACKAR, RAM N	

ART UNIT	PAPER NUMBER
1763	12

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/686,370	SAITO ET AL.	
	Examin r	Art Unit	
	Ram N Kackar	1763	

-- Th MAILING DATE f this communication appears n th cover sheet with the correspondence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1,3-6,8-11 and 14-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6,8-11 and 14-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachm nt(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3-6 and 8-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In this instance the claim 1 recited the broad limitation that the ratio of the number of primary gas supply holes and the number of circulating gas supply holes is set equal to the ratio of a target flow rate for said primary gas and a target flow rate for said circulating gas while the

claim also recites the narrower statement that the number of circulating holes is greater than the primary holes.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-6, 8-11 and 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurihara (JP 09251981 A) in view of Umotoy et al (US 6086677) and Moslehi et al (US 5453124).

Kurihara et al disclose independent gas flow systems comprising, primary gas flow (Fig 5, 111 or 112), circulating gas flow (107), both through plurality of holes (Fig 5 302), a vacuum apparatus (303 and 106) and constancy of density and hole radius for primary gas supply constant over the surface where holes exist (Fig 5-302).

Kurihara et al however do not disclose radius and density of primary gas supply holes constant over entire surface where any holes exist and that the number of circulating holes being higher than the primary supply holes.

Umotoy et al disclose a supply system for two independent gases (Fig 1-116,118) where gases enter the processing chamber through a showerhead so that the holes are inter spread and both primary and secondary holes density and radius are constant over entire surface (Fig 1-148).

Moslehi et al teach a programmable multizone gas injector where injector parameters could be varied in any number of ways (Abstract, Fig 1 and Col 7 lines 22-29). Thus the number of holes or the area of holes, in a zone could be made higher or lower compared to another zone depending upon process requirement.

Therefore it would have been obvious for one of ordinary skill in the art at the time invention was made to replace the shower head of Kurihara with the one of Umotoy et al with higher circulating gas holes, so as to make both primary and circulating gases flow evenly on the substrate with required circulating gas with higher conductance.

Regarding claim 3 -5 Umotoy et al disclose radius, density and ratio of density of gas supply holes, constant over entire surface (Fig 1-148). As an example, the ratio of area over which primary and circulating holes exist is disclosed to be 1, which would be one of the valid ratios of target flow rates. Setting of holes radius and density to ensure back –pressure below the rating of the vacuum pump would be an obvious feature to ensure integrity of the vacuum system.

Regarding claim 6 Kurihara discloses means of controlling conductance and in turn flow (Fig 5 112 and 108).

Adjustment of these controls in addition to hole radius and hole density to make the conductance of circulating system higher than that of primary gas supply in order to achieve target flow without increasing back-pressure would be obvious to one of ordinary skill in the art at the time invention was made.

Regarding claim 8 both Kurihara et al (Fig 5- 302) and Umotoy et al (Fig 1-144 and 136) disclose buffer space above primary and circulating holes.

Regarding claim 9 and 21 Kurihara et al disclose means for filtering circulating gas (Fig 1- 113).

Claims 10, 11, 22 and 23 are directed to an intended use and do not structurally define any thing over Kurihara.

Response to Amendment

Applicants arguments filed on 01/16/2003 are considered but found to be non persuasive. Prior art of Kurihara, Umotoy and Moslehi has basically disclosed the claimed invention. Kurihara discloses circulating a part of exhaust gas back to the process chamber for the reason of conservation. Umotoy and Moslehi teach the way of distribution of primary or circulating gas through showerhead in a uniform way. Moslehi additionally teaches that plurality of gases can be injected through plurality of zones and may be configured as per the process needs.

The number of circulating holes are related to the conductance and the flow of circulating gas and are therefore driven by the process requirement as taught by Moslehi and would therefore be obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 703 305 3996. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703 308 1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9310 for regular communications and 703 872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0661.

RK
February 13, 2003

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